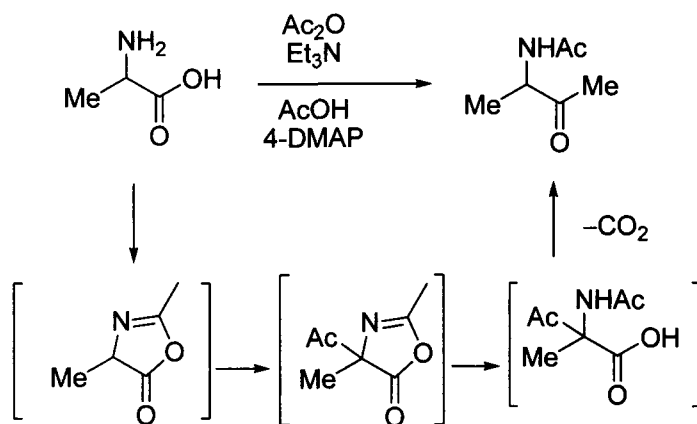


Tubercidin, toyocamycin, and sangivamycin are naturally occurring anti-bacterials, and their synthetic analogues have shown intriguing biological activities. Pyrrolo[2,3-*d*]pyrimidines are the central nucleus of these natural products. Thus, the inverse electron demand Diels–Alder reaction of 2-amino-4-cyanopyrroles with 1,3,5-triazines was reported.²⁶ This methodology is suitable for one-pot syntheses of highly substituted and highly functionalized pyrrolo[2,3-*d*]pyrimidines. It was suggested that the initial [4 + 2] cycloaddition reaction is a stepwise reaction, and the subsequent reactions may proceed via a retro Diels–Alder (RDA) reaction of the [4 + 2] cycloadduct with the loss of XCN followed by elimination of ammonia or ammonium chloride to produce pyrrolo[2,3-*d*]pyrimidine product in a regioselective manner.

Derivatives of pyrrolo[2,3-*d*]pyrimidines have also been extensively investigated as inhibitors of epidermal growth factor receptor (EGF-R) protein tyrosine kinase, and their potentials in the treatment for proliferative diseases involving mitogenic signaling from the EGF-R. Large amounts in the 100-kg range of this heterocyclic compound was needed to support development of pyrrolo[2,3-*d*]pyrimidine-derived anti-tumor reagent. Thus, a short and efficient synthesis of 4-(3-chlorophenylamino)-5,6-dimethyl-7*H*-pyrrolo[2,3-*d*]pyrimidine starting from cheap alanine and malononitrile was developed.²⁷



A Dakin–West reaction on plant scale is demonstrated by elaboration of a modified procedure avoiding uncontrolled release of carbon dioxide. It seems to be generally accepted that the mechanism involves dehydrative formation of an azlactone (oxazolinone), which is then *C*-acylated (in equilibria with *O*-acylation), undergoes ring-opening hydrolysis, and then decarboxylates to form the acylamino ketone. Pyrimidine ring formation is achieved in a simple one-pot reaction, which is followed by a simple isomerization. Laboratory experiments had made clear that the mechanism